CHEVROLET-DETROIT GEAR & AXLE

SAMPLE MATERIAL WORK SHEET

Source: S.K.D. Mfg. Part Number: 6263892

Part Name: Arm-Steering Knuckle L/C B/P Date: 7/17/73

Inspected by: Kenneth Hammons Date 5/31/84

	Blueprint Dimension	Dimension Checks	Comments
1.	.160 ±.02	.177 shelf side	.154 opp. side
2.	15°10' ±0°30'	15°11 58"	
3.	1.713 Ref.	1.694	
4.	.2165 Ref. *	.086 - .130	
	4.9585 Ref.	5.1325 +174	
	.160 ±.02	.195 @ 15°10'	
	plane "Z" parallel	within .01	

00151

G&A-24
Rev. 6-76

CHEVROLET-DETROIT GEAR & AXLE
DIVISION OF GENERAL MOTORS CORPORATION
1840 HOLBROOK AVENUE
DETROIT MICHIGAN 48212

#3 Plt #6

INSPECTION SAMPLE APPROVAL REPORT

Model Year _____

Date of Issuance: 8-7-84 Part Number: 6263891

Checked to B/P Dated: 7-17-73 Part Name: Arm-Steering Knuckle L/C/A

Samples from Lot Number: Sample Quantity: 1 pc.

Date Received: 7-18-84 Pattern(s) Number: _____

Supplier: K. S. D. Mfg.

INSPECTION RESULTS

Dimensional Conformance Check: ☐ Dimensionally OK ☒ See attached sheet(s)

Chevrolet Laboratories Lab Lot Number: 1008 - 1009 Laboratory Analysis: ☐ Accept ☐ Reject ☐ Passable

Comments: _____

Layout Inspector: Kenneth Hammons Date: 8-7-84

DISPOSITION

Based on the results above, your samples have been:

☒ Approved Item 64 to be corrected by source per J. Zelle at S.K.D. on 8-8-84. (Corrected sample to be submitted)

☐ Provisionally approved Not in area under suspicion

☐ Correct and proceed with shipments; corrections must be made on the first production shipment.

☐ Proceed with _____ pieces in production shipments and submit new samples.

☐ Accept as received. Proceed with shipments; however, samples for new dies or molds must reflect corrections to dimensional discrepancies.

☐ REJECT - SUBMIT NEW SAMPLES.

Supplier verbally contacted: Jerry Zelle by: Kenneth Hammons Date: 8-8-84

Comments: _____

Disposition authorized by: George De Ville Date: 8-8-84

UM0152

_____ Date: _____

Superintendent of Inspection

-76

..V ..LET-DETROIT & AXLE
DIVISION OF GENERAL MOT.. CORPORATION
1340 HOLBROOK AVENUE
DE..OIT MI..HIGAN 48212

INSPECTION SAMPLE APPROVAL REPORT

Date of ...ance: 8/7/84 — Part Number: 6263891

...d ...ed: 7/17/73 — Part Name: Asm-Steering Knuckle. L/C/A

Lot Number: Sample — ...: LC

Rec... ...d: 7/18/84 — ... Number:

...er: S.K.D. mfg

INSPE... RESULTS

...ension Conformance ...k: [ ] ...imensionally OK — X See attached sheet(...

...ple ...oratories ...ot ...: 1008-1010 ...oratory ...ly... Accept... ...able

...ments

ILLEGIBLE

...ign Inspector: Kenneth Hammons 8/7/84

DISPOSITION

...ed on the results ... your samples hav... been:

X Ap...ed NOTE Item #4 to be corrected by source, per J. Zelle at S.K.D. 8/8/.. (sample to be summitted)

Pr... ...ionally ap...

[ ] Correct... ...oceed with shipments; corrections m... ...e on the ...ir production ...ment.

[ ] Proceed ... pieces in produc... ...nt and ... new sample...

[ ] Acc... as received ...oceed with shi...nts; however, sampl... ...ies or ...ls must reflect correc... to dimensional discrepancies.

[ ] REJECT SUBMIT NEW ...PLES.

...plier verbally conta...: Jerry Zelle by: Kenneth Hammons Date: 8-8-4

...ents:

...s ...thorized: George Zelle 8-8-4

...er inter... ...tion

000153

CHEVROLET-DETROIT GEAR & AXLE

SAMPLE MATERIAL WORK SHEET

Source: S.K.D. Mfg. — Part Number: 6263891

Part Name: Arm - Steering Knuckle 4/c/A — B-P Date: 7/17/73

Inspected by: Kenneth Timmons — Date: 8/6/84

Blueprint Dimension	Dimension Checks	Comments
1. .160 ±.02	.183 / shelf side	.188 / opp. side
2. 15°10' ±0°30'	14°40' 48"	
3. 1.713 Ref.	1.739	
4. .2165 Ref.	.100 -.165	
4.9585 Ref.	5.1159	

5534

000157

JUL 05 1984

2

Truck & Bus Group
General Motors Corporation
31 Judson Street
Pontiac, Michigan 48058

cc
T. CASEY
D. PORRIEFLA
R TURKETT
FYI

June 27, 1984

Mr. A. M. Brown Jr.
Detroit Gear and Axle
1840 Holbrook Avenue
Detroit, MI 48212

Subject: Validation Testing Update

Lower control arms 6263891-2 are approved for use in arm asms 14005167-8.

You will be updated regarding the balance of the test program as significant portions are completed.

Very truly yours,

D. C. Raber
Truck Chassis Components

DCR/kaj

cc: M. B. Madden
R. Stach
H. L. Western
R. D. Wood

715

000155

Saginaw

Inter-Organizational

Subject: Test Information Report
T-87G-03P-002LT

Date: 3-31-87

From: Mr. D. H. Pokriefka

To: Mr. E. L. Sturm

GM Truck Group
Milford Proving Ground
Vehicle # 2GCHG31K5H4100O5
Milage: 8755

L.H. Lower Control Arm
Part # 14066885

Cross Shaft Bushing Torque:	240 Ft. Lbs. 210 Ft. Lbs. B/P Spec 125 Min.
Shaft Movement:	Free
Jounce Bumper:	Missing
Shock Brkt & Reinforcement Welds:	OK
Jounce Bumper Brkt Welds	See attached Lab Report 6-44 and 6-43
Ball Stud:	Push out load "O" B/P Spec 2000 # Min.
Lower Control Arm Stamping:	50 MM crack at rear of ball stud

Summary: See Lab Reports 6-43 & 6-44

The lower control arm stamping from SKD appears to have a small radius at the side wall to the ball stud nose. SKD has changed the trim to increase the radius to one inch and provide additional strength in the ball stud area.

The front suspension may be loaded at maximum or beyond maximum load range which is evidenced by broken welds and compressed jounce bumpers.

D. H. Pokriefka
Chief Inspector

cc: R. M. Brown

0001156

T&B 1257 Rev. 2/86

Truck & Bus Operations
Reliability Department
Materials Laboratories

Truck & Bus Group

TECHNICAL REPORT

TO: J. M. Quinn

DATE: 12/4/87

FROM: G. L. Haviland

REPORT NO. F[illegible]/62

SUBJECT: Field Complaint; P-Truck Lower Control Arm, P/N 15594133

COPIES: P.F.Birsa
R.E.Rinebolt

REFERENCE:

IR 07330, 9/30/87

Foreword:

One lower control arm broken at its ball stud hole was submitted by Product Service for examination.

Operator: American Bakeries
VIN: 1GDEP32J6F3508598
Mileage: 56,746

Summary:

The control arm was sent to the vendor, Saginaw Division, for their examination. Their report is attached.

Gary L. Haviland
Reliability Metallurgist
Special Analysis Group
6-3438
Reliability Laboratories

/ncd

'87 DE -9 P

PROCESSING

000157

f09462hg

Saginaw

Inter-Organizational

Subject: 15594133 Lower Control Arm

Date: 11-30-87

From: Mr. D. H. Pokriefka

To: Mr. G. L. Haviland

American Bakeries
Vechicle # 1GDHP32J6F3508398
Mileage: 56,746
3/4 Ton L.H. Lower Control Arm

Cross Shaft Bushing torque 220 ft. lbs.
210 ft. lbs.
Spec. 125 ft. lbs. min.

Shaft movement: Free
Jounce bumper: OK
Brackets: Shock bracket OK
Jounce bracket OK
Bushings: Seated
Ball Stud: Pulled out of L.C.A.

Tear Down Inspection: Arm stamping cracked from the outer wall end face to the ball stud mounting hole. Stamping source is SKD

Summary: The lower control arm stamping from the SKD Company appears to have a small radius at the transition of the side wall to the ball stud nose. The crack appears to have started at the base of the radius. The stamping was changed on 7-18-86 to incorporate a one inch radius to provide additional strength in the ball stud area.

D. H. Pokriefka

D. H. Pokriefka
Chief Inspector. Plant # 56

000158

Saginaw

Subject: 15594133 Lower Control Arm

Date 1-19-88

From Mr. D. H. Pokriefka

To Mr. G. L. Haviland

Harrison Delivery
Vehicle # 1GDHP32M3G3502666
Mileage 46,000
3/4 Ton L.H. Lower Control Arm

Cross Shaft Bushing Torque	200 Ft. lbs 195 Ft. lbs Spec. 125 Ft. lbs Min.
Shaft Movement	Free
Jounce Bumper	Missing
Brackets	Shock OK Jounce OK
Bushings	Seated
Ball Stud	Missing pulled out of L.C.A.

Tear Down Inspection Arm stamping is cracked from the outer wall end face to the ball stud mounting hole The bottom surface of the arm is scrubbed off and the origin of the crack is not evident.

Summary The lower control arm stamping is from the SKD Company and does not have a julian date stamp. The crack is similiar in appearance to the known stamping dates and probably started in the radius at the transition of the side wall to the ball stud nose. The stamping configuration was changed on 7-18-86 to incorporate a one inch radius to provide additional strength in the ball stud area.

D. H. Pokriefka
Chief Inspector. Plant # 56

000159

8-7-87
11

G-30 L/C/A HISTORY
(P/N 14026585 L/C/A ASM AS SERVICED)

07AUG87 8:25 EARL GAUTSCHE - FLEET SERVICE CAC 8-562-5533
- G-30 CUTAWAYS (18 PASS) SCHOOL BUSSES, 6.2 L DIESELS
* - 13 L/C/A ASM CRACKED IN BALL JOINT AREA (LH) ONLY (P/N 14026585 SERVICED ASM)
* - 45 BUSES IN FLEET (TYPICAL VIN # 2GBHG31J1G4101766)
- OCCURANCES AT APPRX 50,000 + MILES
- BUSSES MADE BY CARPENTER 'BODY WORKS')
- (SAN DIEGO CITY SCHOOLS
MAINTENANCE DEPT
2351 CARDINAL LANE
SAN DIEGO, CALIF 92123
ATTN: DAN HARGRAVES (MAINT. MGR.) (619) 278-7440)
- PHOTOS PROVIDED (POOR)
- STATE HIGHWAY PATROL AND D.O.T. INVOLVED

07AUG87 2:26 DAN HARGRAVES - (MAINT MGR,
- FRT SUSP TAGS ON 2, VEHICLES VERIFIED AS:
SAP 15597838
* - 9 L/C/A ASM CRACKED CHANGED 4 (DIFFERS FROM E. GAUTSCHE)
- HELWIG TRANSVERSE LEAF SPRING FAILED (BY HIMSELF)
DUE TO: TIRES WEARING OUT AT 2000 MILES (RADIAL TIRES)
- IDLER ARMS WEARING OUT AT 3-4000 MILES
* - 33 BUSSES IN FLEET (DIFFERS FROM E. GAUTSCHE)
- TOLD BY THOMAS BUS COMPANY (COMPETITOR TO CARPENTER) THAT THE CHASSIS USED IS ONLY 8600 # GVW.
- CARPENTER MAINTAINS THAT VEHICLE IS RATED AT 11,000 GVW.

10AUG87 8:05 GENE STURM - TVB CHASSIS DESIGN ENGR - 5-292-3108
- MUST SEND IDENTICAL REPLACEMENT L/C/A ASM. (NOT THOSE REINFORCED FOR F-92 HEAVY DUTY OPTION)
- NO EVIDENCE TO SUPPORT A NEED FOR HEAVY DUTY ARMS OR CROSS MEMBER PARTS MADE TO PRINT MEET ALL SCHEDULE REQUIREMENTS.
- SAYS PROBLEM IS DUE TO IMPROPER TRANSITION RADIUS AT THE U- (REF. TR. # T-87G-03A-0024T)

000160

#11 A

16AU87 11:30 EARL GAUTSCHE

- SHIP (13) PC LH 14026585
  (3) ~~PC~~ PC RH 14026586 (FIGURE REVISED 12AU87)
- WILL BE ORDERED THRU WAREHOUSING WITH A P.O.
  (AGREED TO DO THIS PER SD REQUEST, ORIGINAL DIRECTION FROM AVS 07AU87)

12AU87 8:11 EARL GAUTSCHE

- KNOWN AREAS WITH COMPLAINTS -
  - SAN DIEGO SCHOOL DISTRICT (DESCRIBED)
  - GALIN TRANSPORTATION CO., STANHOPE N. J.
    75 VEH. IN FLEET, 2 LCA'S HAVE CRACKED THIS WINTER.
    6.2L DIESEL, G-30's
    VIN # 2GBGG35J9F4194[illegible]
    # 2GBGG35J3F4139519
    (VIN HISTORIES CLEAN)
    DAVE BRAKE REC'D CALL YESTERDAY.
  - (UNKNOWN SOURCE) NORTH DAKOTA
    LH G-30 CRACKED
    OTHER INFO NOT IMMEDIATELY AVAILABLE

000161

[redacted]

[redacted]

ILLEGIBLE

STS
STRUCTURAL TESTING SERVICES INC.
5859 EXECUTIVE DRIVE EAST WESTLAND, MICHIGAN 48185
313 326 7090

January 25, 1984

Mr. Ron Stach
Chevrolet Gear and Axle
1840 Holbrook
Detroit, Michigan 48212

Dear Mr. Stach:

Subject: Truck Crossmember and Suspension Component Testing

Based on our understanding of your requirements, we are enclosing cost and timing to conduct the required test program. Timing is based on a 3-shift, 6-day per week effort.

Costs:	2 Shifts,	3 Shifts,
Test	5½ Days per Week	6 Days per Week
Brake Reaction (0282)	$1,200 each sample	$2,700 each sample
2g/2g (0158)	$3,400 each sample	$4,900 each sample

Setup of second test site dedicated to 2g/2g testing (One-time charge). $4,000

Conversion of first test site from brake reaction to 2g/2g (One-time charge) as quoted. $2,500

Timing: (see enclosure)

If you have any questions, please contact me.

Thank you for this opportunity to quote your testing needs.

Sincerely,

M. B. Madden, Manager
Marketing & Sales Engineering

MBM:cd
Enclosure

000163

Time Schedule
Truck Crossmember and Suspension Component Testing

Estimated completion of 3 samples each model (based on 3-shift, 6-day per week operation).

Crossmember Assemblies
Proj. 732-733

Test	911	640	158	138
Brake Reaction (0282) First Setup	Compl.	Compl.	2/2	2/11
2g/2g (0158) Second Setup	2/25	3/13	3/27	4/12

Test 0282 - Estimate 2.5 days per sample
Test 0158 - Estimate 4.5 days per sample

? ? 21

Suspension Arms

Test	6263851-2 UCA	6263811-2 UCA 6263891-2 LCA	337581-2 UCA 6263891-2 LCA
Brake Reaction (0282) First Setup	2/21	3/1	3/10
2g/2g (0158) Convert First Setup	~~4/4~~	4/4 5/19 2/13	? —
2g/2g Second Setup	—	— 1/13	4/25 5/28

3.5

Test 0282: Estimate 2.5 days per sample
Test 0158: Estimate 13 days per sample

? 30 39 21 60

1 S/U 2 shifts 3½ days

Y/S

2 S/U 3 shifts 6 days

000164

STS

STRUCTURAL TESTING SERVICES INC.
5830 EXECUTIVE DRIVE EAST WESTLAND, MICHIGAN 48185
313 326 7090

January 30, 1984

Mr. Ron Stach
Chevrolet Gear and Axle
1840 Holbrook
Detroit, Michigan 48212

Dear Mr. Stach:

Subject: Truck Crossmember and Suspension Component Testing
Re-Quote (See Original Quote Dated 1/25/84)

Based on our understanding of your requirements, we are enclosing cost and timing to conduct the required test program. Timing is based on a 3-shift, 6-day per week effort.

Costs:

Test	(As Quoted) 2 Shifts, 5½ Days per Week	3 Shifts, 6 Days per Week
Brake Reaction (0282) All	$1,200 each sample	$2,700 each sample
2g/2g (0158) Crossmember Assys.	$3,400 each sample	$4,900 each sample
2g/2g (0158) Suspension Components	---	$14,200 each sample

Setup of second test site dedicated to 2g/2g testing (One-time charge). $4,000

Conversion of first test site from brake reaction to 2g/2g (One-time charge), as quoted. $2,500

Timing: (see enclosure)

If you have any questions, please contact me.

Thank you for this opportunity to quote your testing needs.

Sincerely,

M. B. Madden

M. B. Madden, Manager
Marketing & Sales Engineering

84 FEB 3 P3:32

000165

MBM:cd
Enclosure

CHEVROLET GEAR & AXLE
PURCHASING DEPT.

Feb 20, 1984

Mr. Ron Stach
Chevrolet Gear and Axle

January 30, 1984
Page 2

Time Schedule *
Truck Crossm- :er and Suspension Component Testing

Estimated completion of 3 samples each model (based on 3-shift, 6-day per week operation).

Crossmember Assemblies
Proj. 732-733

Test	911	640 R	158	138
Brake Reaction (0282) First Setup	Compl.	Compl.	2/2	2/11
2g/2g (0158) Second Setup	3/1 2/25	3/17 3/13	3/13 3/27	4/19 4/12

Test 0282 - Estimate 2.5 days per sample
Test 0158 - Estimate 4.5 days per sample

Suspension Arms

Test	6263851-2 UCA	6263811-2 UCA 626[illegible]-2 LCA	337581-2 UCA 6263891-2 LCA
Brake Reaction (0282) First Setup	3/1 2/21	3/23 3/1	4/3 3/10
2g/2g (0158) Convert First Setup	--	3/2 4/[illegible]	6/14 5/5 (2 sets)
2g/2g Second Setup	--	---	5/19 4/30 (1 set)

Test 0282: Estimate 2.5 days per sample
Test 0158: Estimate 13 days per sample

* Based on support parts and information being available as needed.

000166

½ cc A-Porter Purchasing 3-27

CHEVROLET GEAR & AXLE
PURCHASING DEPT.

84 FEB 28 P 3:29

STS
STRUCTURAL TESTING SERVICES INC.
8850 EXECUTIVE DRIVE EAST WESTLAND, MICHIGAN 48185
313 326 7090

February 20, 1984

Mr. R. Stach
Purchasing Department
Chevrolet Gear and Axle Division
General Motors Corporation
1840 Holbrook
Detroit, Michigan 48212

Dear Mr. Stach:

Subject: Korreck Crossmember Test Status
Control Arm Test Status

Enclosed is the revised time schedule, based on known information as of this date.

Five (5) days were lost on the startup of Setup #2 due to shortage of correct steering linkage assemblies. From the early results of the 2G test, it appears the test may take longer than anticipated because of numerous spring failures which generate down time.

The brake reaction test on the 14067158 assemblies required 5 samples instead of 3. The first sample was assembled with incorrect parts. The fourth sample did not make the test bogie and was terminated at 84,000 cycles.

As of this writing, both test sites are in operation.

We have started to invoice Korreck on a monthly basis for the crossmember test work. We assume they should also be charged for the 3rd-shift premium, as applied to the crossmember work, excluding the 14067138 assemblies. PLEASE ADVISE.

At the end of February, we will need to start invoicing Chevrolet Gear & Axle for the second setup and test work completed. We do not have a purchase order at this time. PLEASE ADVISE.

000167

As you know, this combined crossmember/control arm test program is of substantial test magnitude. Our estimated completion dates are ambitious.

If you have any questions, please contact me.

Sincerely,

M. B. Madden

M. B. Madden, Manager
Marketing & Sales Engineering

MBM:cd
Enclosure: Time Schedule

000168

Time Schedule *
Truck Crossmember and Suspension Component Testing

Estimated completion of 3 samples each model (based on 3-shift, 6-day per week operation).

Crossmember Assemblies
Proj. 732-733

	4518	672	614	1238
Test	911	640	158	138
Brake Reaction (0282) First Setup	Compl.	Compl.	Compl.	3/10
2g/2g (0158) Second Setup	3/1	3/17	4/3	4/19

Test 0282 - Estimate 2.5 days per sample.
Test 0158 - Estimate 4.5 days per sample.

Suspension Arms

Test	6263851-2 UCA	6263811-2 UCA 6263891-2 LCA	337581-2 UCA 6263891-2 LCA
Brake Reaction (0282) First Setup & (0283)	3/1	3/23	4/3
2g/2g (0158) Convert First Setup	---	5/30	6/14 (1 Set)
2g/2g Second Setup	---	---	5/19 (2 Sets)

Test 0282 - Estimate 2.5 days per sample.
Test 0158 - Estimate 13 days per sample.
Test 0283 - Estimate 1 day per sample.

DUNC

* Based on support parts and information being available as needed.

000169

TEST RESULTS SUMMARY

June 18, 1984

Test 795	Status	Remarks
(Test 0158) 2g/2g PN 6263891-2 (CCJ) (Weld Assy. 14005167-8)	Completed Sample Sets #1, #2 to 500,000 cycles. Third set in progress. Expected completion June 29.	Sample #1 found L.H. shock bracket weld too close to edge of arm, causing failure at 180,000 cycles. At completion of 500,000 cycles, cracks were noted in spring seat area.
PN 6263891-2 (CCB) (Weld Assy. 14005171-2)	Three Sample Sets required. Test to start July 2. Expected completion August 13.	
Test 794		
(Test 0282) Brake Reaction (Test 0283) Panic Brake		
PN 6263851-2 (DHS) U C/A	Three Sample Sets complete March 1, 1984.	Validation complete.
PN 6263811-2 (CCJ) U C/A	Three Sample Sets complete May 2, 1984.	Validation complete.
PN 337581-2 (CCB) U C/A	Two L.H. and one R.H. complete to 100,000 cycles as of June 15, 1984. NOTE: Second R.H. in progress. Third L.H. in progress.	Sample #1 R.H. failed at rear bushing reinforcement 49,300 cycles. Sample #2 R.H. failed as noted at 36,860 cycles. Sample #3 R.H. failed as noted at 38,870 cycles.
(Test 0282) Brake Reaction PN 6263891-2 (CCJ) (Weld Assy. 14005167-8)	One L.H. complete to 100,000 cycles (SKD-2) Test to be conducted after U C/A's 337581-2.	Sample #1 (SKD-1) failed at 26,670 cycles forward bushing extrusion. Sample #1 (SKD-2) R.H. failed 55,350 cycles. Sample #2 (SKD-2) R.H. failed 74,650 cycles.
PN 6263891-2 (CCB) (Weld Assy. 14005171-2)	Three Sample Sets completed June 15, 1984 to 100,000 cycles each.	

STS
STRUCTURAL TESTING SERVICES, INC.
5859 EXECUTIVE DRIVE EAST WESTLAND, MICH. 48185
(313) 326-0090

October 2, 1984

Mr. Ron Stach
Purchasing Department
Chevrolet Gear and Axle Division
General Motors Corporation
1840 Holbrook
Detroit, MI 48212

Dear Mr. Stach:

Subject: Completion of Upper and Lower Control Arm Validation Testing
Test Results Summary - Tests #794, #795

S.T.S. Test No.	Test Proc.	C/A No.	Sample No.	Remarks
Brake Reaction 794	0282	Upper C/A 6263851	1,2,3	Completed 100,000 cycles and accepted.
794	0282	Upper C/A 6263852	1,2,3	
794	0283	Upper C/A 6263851	4,5,6	Completed 30 cycles forward and 10 cycles rearward and accepted.
794	0283	Upper C/A 6263852	4,5,6	Completed 30 cycles forward and 10 cycles rearward and accepted.
794	0282	Upper C/A 6263811	7,8,9	Completed 100,000 cycles and accepted
794	0282	Upper C/A 6263812	7,8,9	
794	0283	Upper C/A 6263811	10,11,12	Completed 30 cycles forward and 10 cycles rearward and accepted.
794	0283	Upper C/A 6263812	10,11,12	Completed 30 cycles forward and 10 cycles rearward and accepted.

000171

Upper and Lower Control Arm Validation Testing
Test Results Summary Tests #794, #795

S.T.S. Test No.	Test Proc.	C/A No.	Sample No.	Remarks
794	0282	Upper C/A 337581	14A	Completed 100,000 cycles and accepted.
794	0282	Upper C/A 337581	14B	
794	0282	Upper C/A 337581	15A	
794	0282	Upper C/A 337581	17A	Failed at 32,845 cycles.
794	0282	Upper C/A 337581	17B	54,994
794	0282	Upper C/A 337581	18	37,664
794	0282	Upper C/A 337581	20	Completed 100,000 cycles and accepted.
794	0282	Upper C/A 337581	21	Failed at 46,943 cycles.
794	0282	Upper C/A 337581	22	73,869
794	0282	Upper C/A 337582	14A	49,300
794	0282	Upper C/A 337582	14B	36,860
794	0282	Upper C/A 337582	14C	38,870
794	0282	Upper C/A 337582	14D	Completed 100,000 cycles and accepted.
794	0282	Upper C/A 337582	15A	Failed at 65,460 cycles.
794	0282	Upper C/A 337582	15B	57,180
794	0282	Upper C/A 337582	17A	91,065
794	0282	Upper C/A 337582	19	Completed 100,000 cycles and accepted.

Upper and Lower Control Arm Validation Testing
Test Results Summary Tests #794, #795

S.T.S. Test No.	Test Proc.	C/A No.	Sample No.	Remarks
794	0282	Lower C/A 6263891 (Assy. 1005167)	13A	Completed 100,000 cycles & accepted.
			13B	Failed at 30,000 cycles.
	0282	Lower C/A 6263892 (Assy. 1005168)	13A	55,350
			13B	74,650
			16	54,350
794	0282	Lower C/A 6263891 (Assy. 14005171)	14,15,16	Completed 100,000 cycles & accepted.
	0282	Lower C/A 6263892 (Assy. 14005172)	14,15,16	
795	0158	Lower C/A 6263891 (Assy. 1005167)	1A	Failed at 180,850 cycles.
	2g2g		1B	Completed 500,000 cycles & accepted.
			2	" "
			3	"
	2g2g	Lower C/A 6263892 (Assy. 1005168)	1A	Completed 680,850 cycles & accepted.
			2	500,000
			3A	Failed at 266,540 cycles.
			3B	Completed 500,000 cycles & accepted.
795	0158	Lower C/A 6263891 (Assy. 14005171)	1	500,000 "
			2	"
			3	Failed at 321,090 cycles.
			4	Suspended at 38,000 cycles.

Upper and Lower Control Arm Validation Testing
Test Results Summary - Tests #794, #795

S.T.S. Test No.	Test Proc.	C/A No.	Sample No.	Remarks
795	0158	Lower C/A 6263892 (Assy. 14005172)	1	Failed at 165,630 cycles.
			2	264,260 cycles.
			3	Completed 570,110 cycles & accepted.
			4	Failed at 360,040 cycles.

The above test data documents the test type, cycles completed and number of samples tested. The tests were conducted under the direction of GM Truck and Bus Engineering and co-ordinated through the Gear and Axle Division. It is our understanding that approval of validation of the above listed parts has been finalized by Truck and Bus Enginering.

It has been a pleasure working with the Gear and Axle Division and Truck and Bus Engineering on this project. If you have any questions, please contact me.

Sincerely,

M. B. Madden, Manager
Marketing and Sales Engineering

MBM/mb

cc: D. Pokriefka, Gear & Axle
R. Wood, Gear & Axle
D. Raber, Truck & Bus

000174

ATTACHMENT 'I'

ATTACHMENT 'I'

Saginaw

November 3, 1987

Mr. R. M. Hinzpeter
Truck & Bus Reliability
660 S. Blvd.
Pontiac, Michigan 48053

Subject: 1984-87 Model G,P. & R &/or C Series 30/3500 Front Lower Control Arms

Dear Mr. Hinzpeter:

Light truck front suspensions containing the subject lower control arms were supplied by Saginaw Detroit Plant # 56 and the lower control arm stampings in question were supplied by SKD Manufacturing, Division of SKD Company.

The following is a chronology of the SKD Lower Control Arms 6263891-2:

12-13-83	Project approval
5-4-84	Provisional approval dimensionally by Chevrolet-Detroit Gear & Axle. See attachment # 1 & 1A
6-27-84	Validation testing approved by Truck Chassis Engineering. See attachment # 2
7-26-84	First production shipment by SKD.
8-8-84	Approved dimensionally by Chevrolet-Detroit Gear & Axle. See attachment # 3
5-6-86	Received 2 lower control arms from Conn Limo Service and 3 lower control arms from Fink Bakery. Field Product Reports # 0235JRW & 0236JRW. All L.H. lower control arms were cracked from outer wall end face to the ball stud mounting hole. See attachments # 4, 4A, & 4B
6-?-86	Received detail layout reports from GM DeMexico showing the results of their investigation of cracked lower control arms. See attachment # 5

000177

Mid June 86	Contacted SKD to change blank and incorporate 1 inch radius at outer wall end face. L.H. Arm
7-1-86	SKD changed blank and the 1 inch radius was incorporated.
7-9-86	Saginaw letter to answer report 0325JRW & 0326JRW (correction letter attached). All Fink Bakery & Connecticut Limo Service lower control arms are SKD stampings. See attachments # 6, 6A, 6B, & 6C
7-18-86	SKD julian date (2006) finished lower control arms shipped to Saginaw with radius change. on L.H. arm.
7-21-86	Saginaw Detroit Plant # 56 systematically rotated lower control arm float. The exact date of completion is not recorded.
10-14-86	Meeting between E.L. Sturm and D. H. Pokriefka to review the lower control arms and T.I.R. # T-87G-03A-002LT. See attachment # 7 & 7A
12-?-86	Received 1 R.H. and 1 L.H. lower control arm and Fleet Service Product Report # HWD 1103. See attachment # 8
3-31-87	Letter to E.L. Sturm to answer T.I.R T-87G-03P-002LT. See attachment # 9
3-31-87	Letter to E. Albers to answer Fleet Service Product Report HWD 1103. See attachment # 10 & 10A
8-7-87	Information forwarded to D. H. Pokriefka by J.S. Michalek regarding conversation between Earl Gautsche, Fleet Service and R.M. Brown and his staff. See attachments # 11, 11A & 11B
9-15-87	Conversation with Dave Hazelhurst from Chevrolet Fleet Service regarding GTW Railroad Fleet. One unit, L.H. ball joint dropped out and a check of their 90 truck fleet revealed 22 cracked L.H. lower control arms. Dave Hazelhurst working with GTW to correct the condition.
10-14-87	Received 1 L.H. lower control arm and letter from Gary Haviland. See attachments # 12 & 12A
10-15-87 11:15am	Received phone call from Doug Sloan Truck & Bus Legal Group 8-353-5106 regarding cracking lower control arms and gave him information over the phone relative to dates when SKD started supplying and when correction was in place. See 7-26-84 & 7-18-86
10-16-87 1:00pm	Met with Charles R. Matthews from Product Investigation, GM Tech Center to review some of the information attached in this report and in his report.

10-21-87 Dexed Lab Report 6-39. Attachment # 6D to C.R. Matthews 8-226-7998 Dex # 8-226-8018

10-29-87 Met with Emil Macionski Truck & Bus Rel. Group regarding cracked lower control arms and was requested to provide an update to PPEC.

Any additional questions please contact D.H. Pokriefka, GM Network 8-564-2534.

Sincerely.

D.H. Pokriefka

D.H. Pokriefka
Chief Inspector Plant # 56

cc: Mr. E. J. Baker Jr.
J. J. Bentley
R. Gardstrum
S. Jones
E. Macionski
R. Potts
J. M. Richards
A. L. Snoddy
J. Stearn

000179

DETROIT, MICHIGAN 48212

INSPECTION SAMPLE APPROVAL REPORT

#1

Model

Date of Issuance: 4-28-84

Checked to B/P Dated: 7-17-73

Samples from Lot Number: Sample

Date Received: 4-23-84

Supplier: S.K.D. Mfg. Co.

Part Number: 6263891 & 92

Part Name: Arm-Steering Knuckle L/C/A

Quantity: 2 pcs

Pattern(s) Number:

INSPECTION RESULTS

Dimensional Conformance Check: ☐ Dimensionally OK ☒ See attached sheet(s)

Chevrolet Laboratories Laboratory Analysis: ☐ Accept ☐ Reject ☐ Passable

Lab Lot Number: 1008 - 1010 Steel

Comments:

Inspector: Kenneth Hammons Date: 4-28-84

DISPOSITION

Based on the results above, your samples have been:

☐ Approved

☒ Provisionally approved

☐ Correct and proceed with shipments; corrections must be made on the first production shipment.

☐ Proceed with _____ pieces in production shipments and submit new samples.

☐ Accept as received. Proceed with shipments; however, samples for new dies or molds must reflect corrections to dimensional discrepancies.

☐ REJECT - SUBMIT NEW SAMPLES.

Supplier verbally contacted: Jerry Zelle - office by: George De Ville Date: 5-7-84

Comments:

Disposition authorized by: D. A. Selewski Date: 5-4-84

000180

Superintendent of Inspection Date:

1840 HOLBROOK AVENUE
DETROIT, MICHIGAN 48212

INSPECTION SAMPLE APPROVAL REPORT

Model Year: _____

Date of Issuance: 5-22-84 | Part Number: 6263892

Checked to B/P Dated: 7-17-73 | Part Name: Arm - Steering Knuckle

Samples from Lot Number: Sample | Quantity: 1 pc.

Date Received: 5-18-84 | Pattern(s) Number: _____

Supplier: S.K.D. Mfg.

INSPECTION RESULTS

Dimensional Conformance Check: [XXX] Dimensionally OK [ ] See attached sheet(s)

Chevrolet Laboratories Lab Lot Number: 1008 - 1010

Laboratory Analysis: [ ] Accept [ ] Reject [ ] Passable

Comments: _____

Layout Inspector: Kenneth Hammons Date: 5-22-84

DISPOSITION

Based on the results above, your samples have been:

[XXX] Approved Note: Item #4 to be corrected by source, per J. Zelle at SKD on 5-24-84.

[ ] Provisionally approved

- [ ] Correct and proceed with shipments; corrections must be made on the first production shipment.
- [ ] Proceed with _____ pieces in production shipments and submit new samples.

[ ] Accept as received. Proceed with shipments; however, samples for new dies or molds must reflect corrections to dimensional discrepancies.

[ ] REJECT - SUBMIT NEW SAMPLES.

Supplier verbally contacted: J. Zelle by: D. A. Salewski Date: 5-24-84

Comments: _____

Disposition authorized by: D. A. Salewski Date: 5-24-84

0004181

_____ Date: _____

Superintendent of Inspection

JUL 05 1984

Truck & Bus Group
General Motors Corporation
31 Judson Street
Pontiac, Michigan 48058

cc
T. CASEY
D. PORRECCA
L TURRETT
FYI

June 27, 1984

Mr. R. M. Brown Jr.
Detroit Gear and Axle
1840 Holbrook Avenue
Detroit, MI 48212

Subject: Validation Testing Update

Lower control arms 6263891-2 are approved for use in arm asms 14005167-8.

You will be updated regarding the balance of the test program as significant portions are completed.

Very truly yours,

D. C. Raber
Truck Chassis Components

DCR/kaj

cc: M. B. Madden
R. Stach
H. L. Western
R. D. Wood

000182

DETROIT, MICHIGAN 48212

INSPECTION SAMPLE APPROVAL REPORT

odel
r

ate of Issuance: 8-7-84
hecked to B/P Dated: 7-17-73
amples from Lot Number: Sample
ate Received: 7-18-84
upplier: K. S. D. Mfg.

Part Number: 6263891
Part Name: Arm-Steering Knuckle L/C/A
Quantity: 1 pc.
Pattern(s) Number:

INSPECTION RESULTS

imensional Conformance Check: ☐ Dimensionally OK ☒ See attached sheet(s)

hevrolet Laboratories
ab Lot Number: 1008 - 1009

Laboratory Analysis: ☐ Accept ☐ Reject ☐ Passable

omments:

ayout Inspector: Kenneth Hammons Date: 8-7-84

DISPOSITION

Based on the results above, your samples have been:

☒ Approved Item #4 to be corrected by source per J. Zelle at S.K.D. on 8-8-84.
(Corrected sample to be submitted)

☐ Provisionally approved

☐ Correct and proceed with shipments; corrections must be made on the first production shipment.

☐ Proceed with _____ pieces in production shipments and submit new samples.

☐ Accept as received. Proceed with shipments; however, samples for new dies or molds must reflect corrections to dimensional discrepancies.

☐ REJECT - SUBMIT NEW SAMPLES.

Supplier verbally contacted: Jerry Zelle by: Kenneth Hammons Date: 8-8-84

Comments:

Disposition authorized by: George De Ville Date: 8-8-84

000183

Date:

Superintendent of Inspection

CHEVROLET General Motors Corporation

Customer **TO PRODUCT INVESTIGATION**

0 3 1 2 3 0 — 9 9 9

0 3 1 2 3 0 — 1 0 7

TO: J. G. SMITH, A. POOLE, MICKLE, B. GIFFIN, D. J. HARVEY, D. D. DIEDERICH, R. T. PRICE, T.A.N.

NOTED E03553

APR 1 '86 RJH

0 3 2 5 J R W

Personal Investigation Yes [ ] No [✓]

Contact Date 0 3 2 7 8 6

Special Investigation/Assignment No.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	G	B	H	P	3	2	J	4	P	3	3	0	8	9	2	4
				Veh. Line	Body Type		Eng.		Yr.	Pl.						

Odometer: 3 0 0 6 2 — Car Report [ ] Truck Report [✓]

Part # 14026581

Name CONTROL ARM

Parts Returned: Yes / No / Held: Yes

Material Disposition: Product Assurance [✓] Plant [ ] Other [ ] Attn: R.J. Huegans

Select Material List Item: Yes [ ] No [✓]

Organization—Location: FINK BAKERY - LONG ISLAND CITY, N.Y.

Personnel Contacted—Source of Information: FSPR 0301 JAD, MIKE IANIZZI

Engine	Trans.	Axle	Other
			6.2L DIESEL, THM400 TRANS, H.D. SUSP. C.M. AIR BAGS IN FRONT P/N 367762, 10,000

Report Subject

85, P3 FR SUSP, LOWER CONTROL ARM, BALL JOINT DISENGAGED, BROKEN ARM

Owner's Complaint

FLEET OPERATES 50-70 1983-85 P30 VANS USED TO DELIVER BREAD GOODS IN THE NEW YORK AREA. FOUR OF SEVEN 1985 VEHICLES IN SERVICE HAVE EXPERIENCED

Operation

BROKEN LEFT FRONT LOWER CONTROL ARMS. NONE OF THE 1983-84 VEHICLES HAVE EXPERIENCED THE PROBLEM. THE VEHICLES WITH THE BROKEN CONTROL ARMS ARE

What Was Found

OPERATED FROM LONG ISLAND CITY - NEW YORK CITY, WHICH HAS POOR ROADS BUT THESE 3 VEHICLES WERE ALL BEING USED TO DELIVER BREAD TO SUBURBAN AREAS ON LONG ISLAND AND IN CONNECTICUT.

ALL 3 LOWER CONTROL ARMS BROKE AT THE OUTSIDE FRONT EDGE AND THE CRACK OPENED TO ALLOW THE LOWER BALL JOINT TO DISENGAGE FROM THE

What Was Done

CONTROL ARM.

ILLEGIBLE

FLEET PERSONNEL HAVE BEEN ADVISED TO INSPECT THE ENTIRE 1985 FLEET FOR CRACKS. THEY WILL RETURN ANY ADDITIONAL CRACKED CONTROL ARMS FOUND.

ADDITIONAL VEHICLES WITH BROKEN CONTROL ARMS —

Results

V.I.N. 1GBHP32J5F3320979, 44465 MILES — TRUCK # 75810

V.I.N. 1GBHP32J3F3320376, 52005 MILES — TRUCK # 75808

SOUND BUMPER & BRACKET MISSING FROM THIS VEHICLE'S CONTROL ARM. FLEET PERSONNEL SAY VEHICLE WAS TOWED IN AND BRACKET MISSING WHEN TOWED IN.

Signature: J. R. Whitney — Title: F.S.E. 00184

Mail To:
Technical Service Operations
C.C.O. Room 163-138
30007 Van Dyke Warren, Michigan 48090

Page 1 of 1

GSD

4-A

CHEVROLET — Chevrolet Motor Division, General Motors Corporation

TECHNICAL SERVICE OPERATIONS

TO — NOTED
- J. C. SMITH
- T. R. POOLE
- J. F. MICKLE
- J. B. GIFFIN
- D. J. HARVEY
- D. D. DIEDERICH
- R. T. PRICE
- TAN

FEB 27 '86 RJH

Field Product Report

Customer: 031230 — 999

Component: 031230 — 158

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	G	C	G	C	2	6	J	3	F	F	1	4	0	3	0	8
				Veh. Line	Body Type		Eng.		Yr.	Plt.						

Odometer: 94535

Car Report: [ ] Truck Report: [✓]

02365RW

Personal Investigation: Yes [✓] No [ ]

Contact Date: 021886

Special Investigation/Assignment No.:

Part # 14026581

Name: CONTROL ARM

Parts Returned — Yes / No / Held: YES

Material Disposition — Product Assurance [ ] Plant [ ] Other [✓] GMC

Select Material Test Ite... Yes [ ]

Organization—Location: CONNECTICUT LIMOUSINE SERVICE - MILFORD, CONN.

Personnel Contacted—Source of Information: F.S.P.R. 0201HWV; MOE - FOREMAN AT FLEET

Engine	Trans.	Axle	Other

Report Subject VIN 1GC2C265?F73?856

85, C2, FR. SUSP, LOWER CONTROL ARM, BALL JOINT DISENGAGED, CRACKED

Owner's Complaint BALL JOINTS HAVE DISENGAGED FROM THE LEFT LOWER CONTROL ARM ON 2 VEHIC...

Operation CONNECTICUT LIMOUSINE SERVICE OPERATES 500 SUBURBANS WHICH ARE USED TO TRANSPORT PASSENGERS TO AND FROM METROPOLITAN NEW YORK AIRPORTS. THE VEHICLES

What Was Found HAVE BEEN STRETCHED BY EXTENDING THE WHEEL BASE AN ADDITIONAL 67.5". CONVERSION IS DONE BY THE ARMBRUSTER CONVERSION CO. VEHICLES CARRY UP TO 11 PASSENGERS AND LUGGAGE. THE FLEET'S ENGINEERING DIRECTOR BELIEVES VEHICLES OPERATE AT TIMES AT MAXIMUM OR SLIGHTLY ABOVE THE RATED GVW. THE CONVERSION CO HAS GVW STICKERS ON VEHICLES PRIOR TO 1985 SHOWING A GVWR OF 8800 LBS 4200 FRONT AND 4200 REAR. THE 1985 VEHICLES SHOW ONLY THE FACTORY GVWR

What Was Done RATING PLATE GVWR IS 8600, GAWR FRONT IS 3800, GAWR REAR IS 6,000.

BALL JOINTS DISENGAGED FROM THE CONTROL ARMS AND SUBSEQUENT INSPECTION REVEALED THE CONTROL ARMS WERE CRACKED AROUND THE BALL JOINT HOLES. THE FLEET INSPECTED ALL OF THEIR 48 1985 MODELS IN SERVICE AND FOUND CRACKED LOWER CONTROL ARMS ON 12 VEHICLES. ALL CRACKS HAVE BEEN ON THE LEFT LOWER CONTROL

Results ARM. THE CRACK STARTS AT THE LOWER OUTBOARD EDGE AND TRAVELS ACROSS AND AROUND THE BALL JOINT HOLE.

THE FLEET HAS REPLACED ALL OF THE CRACKED CONTROL ARMS. PARTS ARE BEING HELD FOR RETURN IF REQUESTED. THE WRITER IS RETURNING ONE ARM FOR

Signature: J.R. Whitney — Title: F.S.E. — 3UUH85

Jay Lewis 396-3997

2/28

Mail To:
Technical Service Operations
C.C.O. Room 163-138
30007 Van Dyke Warren, Michigan 48090

Field Product Report

CHEVROLET MOTOR DIVISION
General Motors Corporation

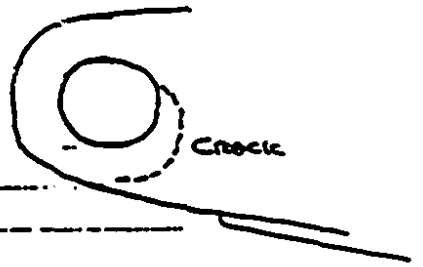
Customer [illegible] — 9191

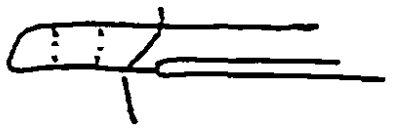
Component [illegible] — 1158

[illegible]

INSPECTION

The company has operated stretched suburbans since 1979 and averages about 300,000 miles in service. Previously this problem has never been observed.





In addition to the vehicle listed above the following vehicles had cracked control arms.

V.I.N.	Mileage
1GCGC26J5FF136521	105,238
JXFF138376	100,039
J5FF136809	102,388
J2FF143636	97,630
J3FF137663	88,501
J1FF138699	92,323
J7FF144345	92,411
J8FF145181	77,037
J1FF136158	92,403
J6FF167091	73,348
W6FF130867	104,000
J6FF139458	73,348

With exception of one vehicle with a 7.4L engine the remaining vehicles are equipped as follows. B3J Diesel, C69 A/C, FSP R.D. Stab. Bar, GT4 3.73 Axles, MX1 Trans, NF2 Fuel Tank, V02 Cooler, Z62 Scottsdale, 129" W.B., LT 235/85R x 16D and 16F Tires, 6.2L Diesel

G.R. Whitman — Signature

[illegible] S.E. — Title

Mail To: Product Assurance Field Activities
C.C.O.B. Room 163-156
[illegible] Van Dyke Warren Michigan [illegible]

GSD 187-A

5

GENERAL MOTORS DE MEXICO, S.A. DE C.V.

PLANTA MEXICO
AV. EJERCITO NACIONAL 843
APARTADO 197 BIS
MEXICO 1, D.F.

June 5, 1986.

Mr. William Scribner
Quality Control Manager
Saginaw Steering Gear
Axle Div.

Attached you will find the results on 3 sample layouts performed in our Quality Control Department, Mexico City Plant.

Needless to say, why we are concern about the problems we have out in the field.

I know we can count on you to help us to solve this discrepancies, but we need material with zero discrepancies, therefore, we are going to be waiting for your answer as soon as possible.

Regards,

Mario V. Nájera
Quality Control Dept.

000187

#6

Saginaw

Inter-Organizational

Corrected letter

Subject: FLEET SERVICE PRODUCT REPORT 0325RW

Date: 11-2-87

From: D.H. Pokriefka

To: R.H. Meinhardt

FINK BAKERY

3/4 Ton Lower Control Arm

#1 Left Hand

CROSS SHAFT BUSIHING TORQUE: 300 Ft Lbs
250 Ft Lbs
Spec 125 min.

SHAFT MOVEMENT: Free

JOUNCE BUMPER: Missing

Brackets: Shock Bracket-OK
Jounce Bracket - repaired hand weld and heavy crash thru witness marks.

BUSHINGS: Seated

BALL STUD: Present "0" pushout load.

TEARDOWN INSPECTION: Arm stamping is cracked from outer wall end face to the ball stud mounting hole. Stamping source is SKD (SEE LAB REPORT #6-39)

3/4 Ton Lower Control Arm
#2 Left Hand

CROSS SHAFT BUSHING TORQUE: 200 Ft Lbs
150 Ft Lbs
Spec 125 min

SHAFT MOVEMENT: Free

JOUNCE BUMPER: Missing

BRACKETS: Shock Bracket - OK
Jounce Bracket - missing welds - did pull metal

BUSHINGS: Seated

BALL STUD: Missing

TEARDOWN INSPECTION: Same as # 1

000188

FLEET SERVICE PRODUCT REPORT 0325JRW
July 9, 1986 continued

3/4 Ton Lower Control Arm
3 Left Hand

CROSS SHAFT BUSHING TORQUE 250 Ft Lbs
200 Ft Lbs
Spec 125 min.

SHAFT MOVEMENT: Free

JOUNCE BUMPER: Compressed

BRACKETS: Shock Brkt - OK

BUSHING: Seated

BALL STUD: Present "0" pushout load

TEARDOWN INSPECTION: Same as # 1

SUMMARY: The lower control arm stamping from SKD Company appears to have a small radius at the transition of the side wall to the ball stud nose. Current stampings also have a small radius in the same area. SKD has changed the trim to increase the radius to 1 inch and provide additional strength in the ball stud area (See Sample)

In addition the customer may be using the front suspensions at max or beyond max load range which is evidenced by broken welds and compressed jounce bumpers. Suggest a heavier rated front suspension be used (14032908 H-22) that has reinforcements at all critical points.

Correction: Additional inspection and dimensional checks have revealed that the stampings are from SKD. D.H.P. 11-2-87

D. H. Pokriefka
Chief Inspector, Plant # 56

0001869

6 2

Saginaw

Inter-Organizational

Subject: FLEET SERVICE PRODUCT REPORT 0236JRN

Corrected Letter

Date: 11-2-87

From: D.H. Pokriefka

To: R.H. Meinhardt

Connecticut Limousine Service
3/4 Ton Lower Control Arm
#1 Left Hand

CROSS SHAFT BUSHING TORQUE: 250 Ft Lbs
200 Ft Lbs
Spec 125 min.

SHAFT MOVEMENT: Free

JOUNCE BUMPER: Compressed

BRACKETS: Shock Bracket - OK
Jounce Bracket - 1 weld broken

BUSHINGS: Seated

BALL STUD: Missing

TEARDOWN INSPECTION: Arm stamping cracked from the outer wall end face to the ball stud mounting hole. Stamping source is SKD. See Lab Report #6-39

3/4 Ton Lower Control Arm
#2 Left Hand

CROSS SHAFT BUSHING TORQUE: 90 Ft Lbs
100 Ft Lbs
Spec 125 min.

SHAFT MOVEMENT: Free

BRACKETS: Shock Brkt - Ok
Jounce Bumper - Compressed
Jounce Brkt - OK

BUSHING: Seated

BALL STUD: Missing

TEARDOWN INSPECTION: Same As # 1

SUMMARY: The lower control arm stamping from SKD Company appears

000130

FLEET SERVICE PRODUCT REPORT 0236JRN
July 9, 1986, continued summary

to have a small radius at the transition of the side wall to the ball stud nose. Current stampings also have a small radius in the same area. SKD has changed the trim to increase the radius to 1 inch and provide additional strength in the ball stud area. (See Sample)

In addition the customer may be using the front suspensions at max or beyond max load range, which is evidenced by broken welds and compressed jounce bumpers. Suggest a heavier rated front suspension be used (14032908 H-22) that has reinforcements at all critical points.

Correction: Additional inspection and dimensional checks have revealed that the stampings are from SKD. DHP 11-2-87

D. H. Pokriefka
Chief Inspector, Plant # 56

000131

CHEVROLET Detroit Gear & Axle Plant

\# 6D

METALLURGICAL LABORATORY

LAB NO. 6-29

DATE 5-15-86

PART NAME Steering Knuckle [illegible]

FROM PLANT #56

PART NO. 6263591

SOURCE SKD Company

SPECIFICATION SAE 1008 or 1010 [illegible]

HISTORY OF MATERIAL [illegible] Part cracked at the stud mounting hole at drawn outer wall.

OBJECT OF INVESTIGATION [illegible]

CONCLUSION The crack appears to be fatigue in origin [illegible] the outer wall end face of the ball stud mounting hole. [illegible] fracture is fine grained and smooth. [illegible] end face [illegible] and [illegible] along the contour of the part for a [illegible] of approximately 2.0. The part has a hardness of RB 65-66 and [illegible] ferrite structure with no irregularities at the fracture. [illegible]

CHEMICAL — PHYSICAL — MICRO 5-16-86 385 — MACRO — OTHER

ARD 5-20

ILLEGIBLE

000192

SIGNATURE [illegible]

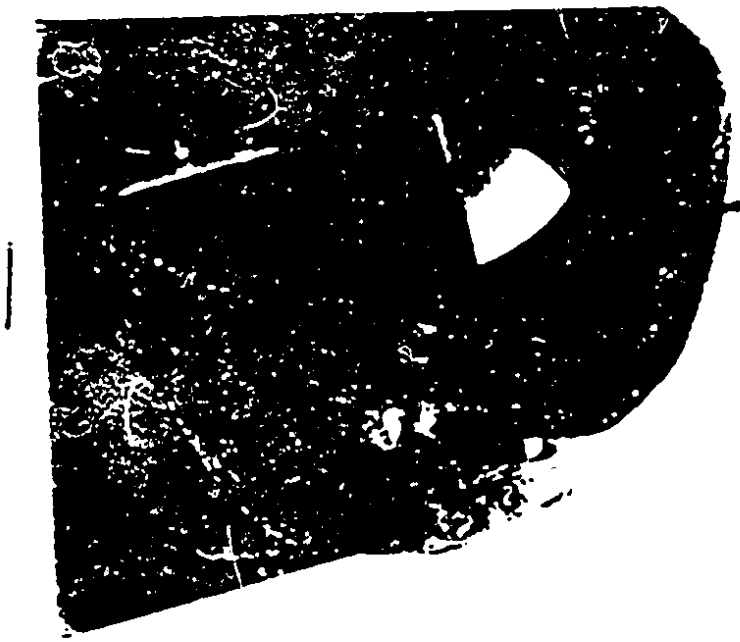
TITLE LAB [illegible]

1 - 6X - 84

Visual Examination

The crack passes through the entire wall thickness and extends for a length of approximately 20°. The fracture faces are fine grained and smooth at the drawn edge and face and progressed along the center of the part with a slightly coarse striated appearance as magnified below.

ILLEGIBLE



000193

FRACTURE AT BALL STUD MOUNTING HOLE AS RECEIVED

LABORATORY REPORT

Sample No.				
	GM Ident. #:	4-1726	6-39	[illegible]
	Mat'l. Ident.	SAE 950 X	SAE 1008-1010	SAE-950AK
	Part Name:	Lever	Lower Control Arm	Lever
	P/N:	15595104	6263891	[illegible]
	Source:	Van Wormer	——	Van Wormer

C	[illegible]	0.08%	[illegible]
S	[illegible]	0.006%	0.008%
P	[illegible]	<0.005%	[illegible]
Si	[illegible]	<0.01%	<0.[illegible]
Mn	[illegible]	0.32%	[illegible]
Cr	——	<0.01%	[illegible]
Ni	——	<0.01%	[illegible]
Mo	——	<0.01%	[illegible]
V	[illegible]	<0.005%	[illegible]
Al	[illegible]	0.065%	[illegible]
Cu	——	0.02%	[illegible]
Co	——	<0.005%	[illegible]
Ti	——	<0.005%	[illegible]
Zr	——	<0.005%	[illegible]
Cb	[illegible]	<0.005%	[illegible]
Ta	——	0.027%	[illegible]
W	——	<0.01%	[illegible]

~~Samples 4-1726 & 4-1720 check like SAE 950AK.~~

Sample 6-39 checks like SAE 1008 or 1010.

ILLEGIBLE

We certify the above analysis to be the true result obtained on the described sample(s).

Analytical Associates, Inc.

by ____________________

Charles K. Beak

Sworn and subscribed before me a Notary Public in and for Wayne

County, State of Michigan this ______ day of ____________

19______

[illegible] ____________________

Commission Expires ____________________

D[illegible]PLICATE LAB REPORT

0001194

Physical Properties

- R|B Core Hardness (Adjacent to crack)

65-66

Microstructure (Radial section, including crack)

The structure consists of fine grained ferrite (size 6-8*) and filament carbide located primarily in the grain boundaries. There are secondary [illegible] which is interspersed [illegible] with no apparent [illegible] in the general structure or at the origin. There is no evidence of a seam or nonmetallic inclusion.

ILLEGIBLE

Spec Low carbon steel

000195

ASTM Grain Size [illegible]

#7 MASTER

GENERAL MOTORS CORPORATION

TEST INFORMATION REPORT

[X] INCIDENT [ ] EOT [ ] SUMMARY

Page 1 of 3

REPORT NO.	T-87G-03A-002LT
DIV REF NO.	
ISSUE DATE	10/8/86
TEST W.O.	27G02-009
INCIDENT DATE	25SE86
PART NO.	15594161

ruck & Bus	ADDRESSEE: E. L. Sturm 2202-8	RESPONSE REQUESTED: X YES / NO
ruck Group ord Proving Ground	INITIATOR: M. T. Prater 9015-MPG	MATERIAL DISPOSITION: Shipped to addressee. 5814 07OCT86
rol Arm Assembly Left Front Lower Left Hand	SERIAL NO.	TROUBLE & CODE: Cracked - 005

NAMEPLATE	PROD / PROTO	X PILOT / OTHER	VIN & BODY ID: 2GCHG31K6H410005	MODEL NO.: CG31603/E38	PART YEAR/LINE: 87 G
512	ENGINE RPO & DISPL.: L05/5.7 L	TRANS RPO: M40	AXLE RATIO/RPO: 4.10	TIRE SIZE: 8.00 x 16.5	WHEEL SIZE
5-36	ODOM MILES: 8,755	VEH TEST MILES: 7,253	PART MILES: 8,755	PART COND MILES: 7,253	MASS RPO: 7960 lb
RG? X	PWR BRK? X	A/C? X	CRUISE?	SUSP 10,000 lb	RAILROAD SIMULATION TEST ___ HRS

NTS (1 BACKGROUND 2 SYMPTOMS 3 ANALYSIS 4 ACTION TAKEN)

t vehicle driver reported "A loud clunking noise" in left front area of vehicle while ing right hand turns. Vehicle inspector and test engineer examined vehicle and covered fracture in lower control arm. Fracture occurred outboard and to rear of ball nt attaching area at transition radius from rear flange to ball joint pad. Length is roximately 50 mm, initiating at radius and progressing to the right on an angle 30 grees to vehicle center line.

iginal unit was removed and returned to vendor for anlaysis. New unit was supplied by sign and installed. Pneumatic bag pressures were measured at time of disassembly and und to be: Left - 21 psi; Right 22 psi.

H. W. Edson - 0973-9015(photo)
T. A. Kunkler - 0973-9015
W. D. Skinner - Canada, Scarbourough
B. L. Reed - 3301-92
W. C. Zatye - 2202-8(photo)
B. E. W[illegible]al - 0973-9015
D. A. Iacofano - 1606-51
E. Johnstron - Lordstown
T & B Lab. Admin. Ctr. - 3301-92(photo)

TRIBUTION — REPORT & RESPONSE ___ CAR PROJECT CENTER* ___ POWERTRAIN PROJECT CENTER MPG 1 CPC-MILFORD* (Only 1 - E.D.V) ___ BOC-FLINT ___ BOC-DETROIT ___ BOC-LANSING ___ OPEL

APPROVAL: M. T. Prater DATE 6 OCT 86 PHONE 8-341-4[illegible]

COMPLETE

SPONSE (IF REQUIRED) | (RESPONSE ADDRESSEE) J. M. O'Shaughnessey - 0973-MPG | TROUBLE AND CODE

REF. NUMBER | PART NUMBER

SPONSE (1 ANALYSIS 2 CORRECTIVE ACTION 3 ACTION VERIFICATION 4 EFFECTIVE DATE)

Comparing the durability lower control arm with the new arm supplied by Saginaw Detroit revealed a significant difference in the transition zone between the up-turned flange and the ball joint pad. The new part had a gradual transition as specified by print dimensions, while the durability part had a more abrupt transition.

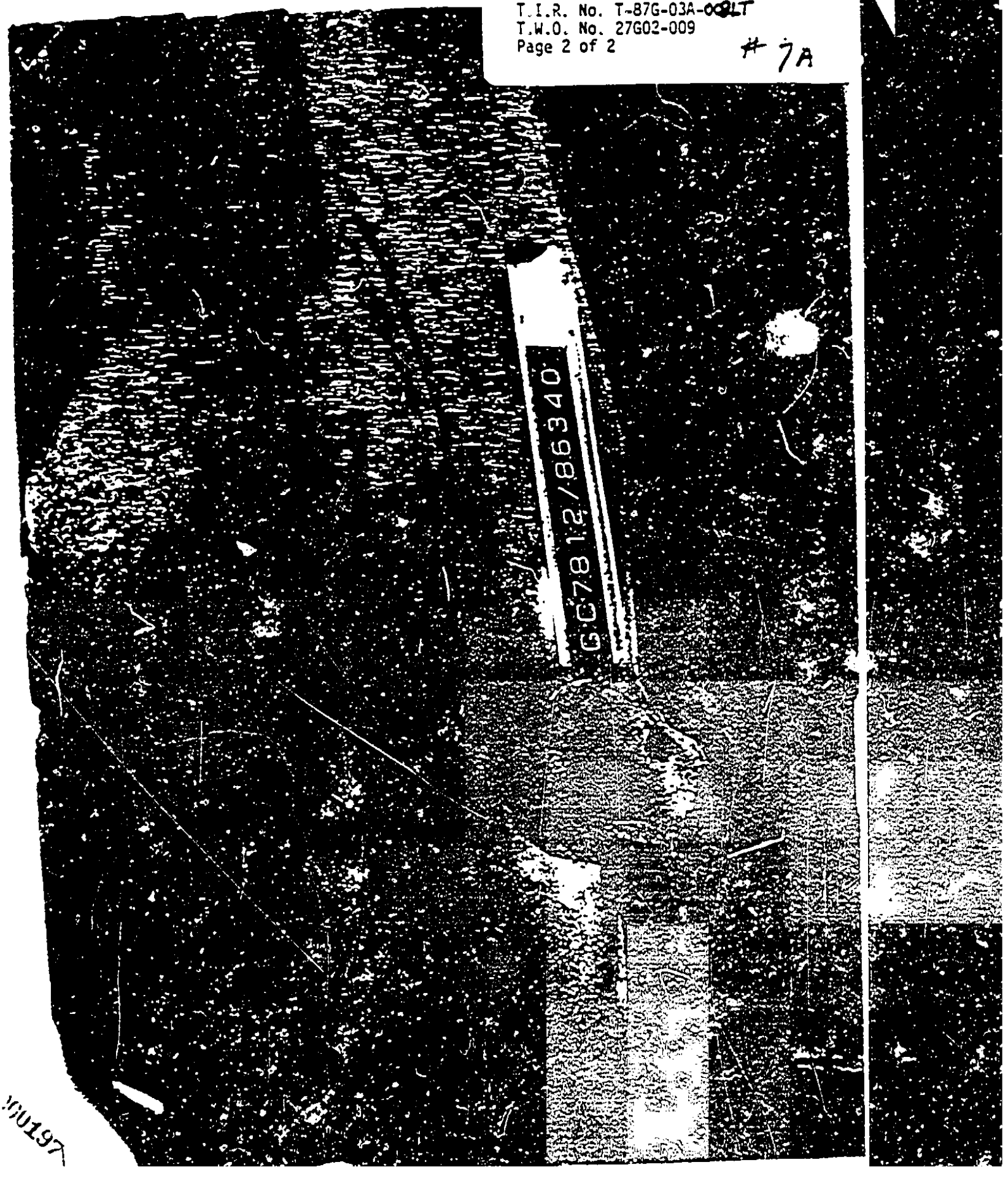
CLOSED

In a meeting with Saginaw Detroit, it was disclosed that in June of 1986, a change was made in blank sources. Now the L.H. control arm looks like the R.H. arm in the transition zone and should perform as well. There is no design action required at this t[illegible]

APPROVED | DATE | PHONE NO.

T.I.R. No. T-87G-03A-00RLT
T.W.O. No. 27G02-009

7A



CHEVROLET Chevrolet Motor Division General Motors Corporation

Fleet Service Product Report

REPORT 1 PE of 3

Customer | URS CODE | - |

Component | URS CODE | - |

R.S.E. Coding Use Only

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	G	C	G	C	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2	0	8

Origin/Type | Veh. Line | Body Type | Eng. | Yr. | Plt. | Production Sequence Number

C.O. USE ONLY

Contact Date 11 24 8[illegible]

Odometer 116000 | Car Report | Truck Report X

Zone 02

Part # 14026581 | Material Held For R.S.E. Yes X No | R.S.E. Material Disposition | Product Assurance | Plant | Other

Name Control arm

Organization—Location | Personnel Contacted—Source

Engine | Trans. | Axle | Other

Report Subject: Control arm cracks (left side only) if not noticed ball stud pulls out & control arm drops on road

Owner's Complaint: Note - left and right control arms replaced and sent to service operation per E Albers req. at

Operation: Typical crack is beginning for left arm. Right arm is clean

What Was Found

The account questions why the condition did not oc[illegible] in the model years 1979, 1980, 1981, 1982, 1983 and 1984 with the typical vehicle retired in service for 300,000 [illegible]

What Was Done: In 1985 model year after eighteen failures with mileages as low as 20,000 at the time of failure the account replaced all left lower control arms on the [illegible] on 1985 models. No repeat failures have been experienced [illegible] no failures have been found on the right arm.

To date 14 failures have occurred on 1986 units

Signature [signature] F[illegible]

R.S.E. Comments. Action

[illegible] ONLY

000198

ILLEGIBLE

Signature | Central Service

1 - R.S.E. 2 - C.O. Svce Operations 3 - FMSO 4 - Fleet Service Manager 5 - Attach to Material

Saginaw

Inter-Organizational

Subject: Test Information Report
T-87G-03P-002LT

Date: 3-31-87

From: Mr. D. H. Pokriefka

To: Mr. E. L. Sturm

GM Truck Group
Milford Proving Ground
Vehicle # 2GCHG31K6H4100005
Milage: 8755

L.H. Lower Control Arm
Part # 14066885

Cross Shaft Bushing Torque:	240 Ft. Lbs. 210 Ft. Lbs. B/P Spec 125 Min.
Shaft Movement:	Free
Jounce Bumper:	Missing
Shock Brkt & Reinforcement Welds:	OK
Jounce Bumper Brkt Welds	See attached Lab Report 6-44 and 6-43
Ball Stud:	Push out load "0" B/P Spec 2000 # Min.
Lower Control Arm Stamping:	50 MM crack at rear of ball stud

Summary: See Lab Reports 6-43 & 6-44

The lower control arm stamping from SKD appears to have a small radius at the side wall to the ball stud nose. SKD has changed the trim to increase the radius to one inch and provide additional strength in the ball stud area.

The front suspension may be loaded at maximum or beyond maximum load range which is evidenced by broken welds and compressed jounce bumpers.

D. H. Pokriefka
Chief Inspector

000199

cc: R. M. Brown

10

Saginaw

Subject: Fleet Service Product Report HWD1103

3-31-87

From Mr. D. H. Pokriefka

Mr. E. Albers

Vehicle # 1GCGC26J56P109708
Milage 116,000
14026581
3/4 Ton Lower Control Arm

Cross Shaft Bushing Torque:	210 Ft. Lbs. 200 Ft. Lbs. Spec. 125 Ft. Lbs Min.
Shaft Movement:	Free
Jounce Bumper:	OK
Shock Brkt & Reinforcement Welds:	OK
Jounce Bumper Brkt. Welds:	OK
Ball Stud:	Seated Push out B/P Spec 2000 # Min. Push out 3800 # and still seate.
Lower Control Arm Stamping: Date: SKD 23 5	Small indication of a crack left side of ball stud hole.

14026582
3/4 Ton Lower Control Arm

Cross Shaft Bushing Torque:	250 Ft. Lbs. 200 Ft. Lbs. Spec. 125 Ft. Lbs. Min.
Shaft Movement:	Free
Jounce Bumper	OK
Shock Brkt & Reinforcement Welds:	OK

000200

Saginaw Steering Gear Division